IN THE CLAIMS

Please amend the claims as follows:

Claims 1-23 (Cancelled).

Claim 24 (Previously Presented): An analyzer, comprising:

a monochromator that receives X-ray radiation emitted by a sample and reflects and refracts the X-ray radiation to create diffraction lines; and

a detector that receives the diffraction lines and converts the diffraction lines into an electrical signal;

wherein:

the monochromator comprises a single-crystal lithium fluoride doped with at least 0.018 mol per kg of a divalent positive ion M present in a fluorinated state; and

the analyzer is configured to perform elemental analysis of the sample.

Claim 25 (Previously Presented): The analyzer as claimed in claim 24, wherein the ionic radius of the divalent ion M ranges from 55 to 80 picometers.

Claim 26 (Previously Presented): The analyzer as claimed in claim 25, wherein M is present in the fluoride in an amount of at least 0.02 mol per kg.

Claim 27 (Previously Presented): The analyzer as claimed in claim 26, wherein M is present in the fluoride in an amount of at least 0.023 mol per kg.

Claim 28 (Previously Presented): The analyzer as claimed in claim 27, wherein M is present in the fluoride in an amount of at least 0.025 mol per kg.

Claim 29 (Previously Presented): The analyzer as claimed in claim 24, wherein M is present in the fluoride in an amount of at most 0.082 mol per kg.

Claim 30 (Previously Presented): The analyzer as claimed in claim 29, wherein M is present in the fluoride in an amount of at most 0.045 mol per kg.

Claim 31 (Previously Presented): The analyzer as claimed in claim 24, wherein M is Mg^{2+}.

Claim 32 (Previously Presented): The analyzer as claimed in claim 24, wherein M is Co^{2+}.

Claim 33 (Previously Presented): The analyzer as claimed in claim 24, wherein M is Zn^{2+}.

Claim 34 (Previously Presented): The analyzer as claimed in claim 24, wherein M is a mixture of at least two ions chosen from Mg^{2+}, Zn^{2+} and Co^{2+}.

Claim 35 (Previously Presented): The analyzer as claimed in claim 24, wherein the fluoride is present in the form of a cube or a parallelepiped shape.

Claim 36 (Previously Presented): The analyzer as claimed in claim 24, wherein the volume of the fluoride ranges from 2.5×10^{-3} cm^3 to 30 cm^3.

Claim 37 (Previously Presented): The analyzer as claimed in claim 36, wherein the volume of the fluoride ranges from 0.01 to 20 cm^3.

Claim 38 (Previously Presented): The analyzer as claimed in claim 24, wherein the fluoride has a cleaved surface.

Claim 39 (Previously Presented): The analyzer as claimed in claim 24, wherein the fluoride has a surface that is ground and then treated in an acid medium or polished,

Claim 40 (Previously Presented): The analyzer as claimed in claim 24, wherein the detector comprises at least one scintillator consisting of a rare-earth halide.

Claim 41 (Previously Presented): The analyzer as claimed in claim 40, wherein the rare-earth halide is $CeCl_3$-doped $LaCl_3$ or $CeBr_3$-doped $LaBr_3$.

Claim 42 (Previously Presented): A method, comprising:

analyzing an element of a specimen with the analyzer as claimed in claim 24;

wherein:

the analyzer comprises a detector consisting of a scintillator; and

the scintillator is set on a line having a wavelength of less than 3 Å.

Claim 43 (Previously Presented): The method as claimed in claim 42, wherein the scintillator is set on a line having a wavelength of less than 2 Å.

Claim 44 (Previously Presented): The method as claimed in claim 43, wherein the scintillator is set on a line having a wavelength of less than 1.5 Å.

Claim 45 (Previously Presented): A single-crystal lithium fluoride doped with 0.023 to 0.082 mol per kg of a divalent positive ion M present in the fluorinated state.

Claim 46 (Previously Presented): The fluoride as claimed in claim 45, wherein the ionic radius of the divalent ion M ranges from 55 to 80 picometers.

Claim 47 (Previously Presented): The fluoride as claimed in claim 46, wherein M is present in an amount of at least 0.025 mol per kg.

Claim 48 (Previously Presented): The fluoride as claimed in claim 47, wherein M is present in an amount of at most 0.045 mol per kg.

Claim 49 (Previously Presented): The fluoride as claimed in claim 45, wherein M is Mg^{2+}.

Claim 50 (Previously Presented): The fluoride as claimed in claim 45, wherein M is Co^{2+}.

Claim 51 (Previously Presented): The fluoride as claimed in claim 45, wherein M is Zn^{2+}.

Claim 52 (Previously Presented): The fluoride as claimed in claim 45, wherein M is a mixture of at least two ions chosen from Mg^{2+}, Zn^{2+} and Co^{2+}.

Claim 53 (Previously Presented): The fluoride as claimed in claim 45, wherein said fluoride is present in the form of a cube or a parallelepiped shape.

Claim 54 (Previously Presented): The fluoride as claimed in claim 45, wherein the volume of said fluoride ranges from 2.5×10^{-3} cm to 30 cm^3.

Claim 55 (Previously Presented): The fluoride as claimed in claim 54, wherein the volume ranges from 0.01 to 20 cm^3.

Claim 56 (Previously Presented): The fluoride as claimed in claim 45, wherein said fluoride has a cleaved surface.

Claim 57 (Previously Presented): The fluoride as claimed in claim 45, wherein said fluoride has a surface that is ground and then treated in an acid medium or polished,

Claim 58 (Previously Presented): A method for preparing a monochromator, comprising utilizing the fluoride of claim 45.

Claim 59 (Previously Presented): A process for performing elemental analysis of a sample, comprising:

exciting the sample with a primary X-ray beam so that the sample emits a second X-ray beam by fluorescence;

reflecting and refracting the second X-ray beam into diffraction lines with a monochromator; and

detecting the diffraction lines and converting the diffraction lines into an electrical signal with a detector;

wherein the monochromator comprises a single-crystal lithium fluoride doped with at least 0.018 mol per kg of a divalent positive ion M present in a fluorinated state.

Claim 60 (New): A single-crystal lithium fluoride doped with 0.023 to 0.082 mol per kg of a divalent positive ion M present in the fluorinated state, wherein essentially all M ions are in the single-crystal cation lattice.

Claim 61 (New): The fluoride as claimed in claim 60, wherein the ionic radius of the divalent ion M ranges from 55 to 80 picometers.

Claim 62 (New): The fluoride as claimed in claim 61, wherein M is present in an amount of at least 0.025 mol per kg.

Claim 63 (New): The fluoride as claimed in claim 62, wherein M is present in an amount of at most 0.045 mol per kg.

Claim 64 (New): The fluoride as claimed in claim 60, wherein M is Mg^{2+}.

Claim 65 (New): The fluoride as claimed in claim 60, wherein M is Co^{2+}.

Claim 66 (New): The fluoride as claimed in claim 60, wherein M is Zn^{2+}.

Claim 67 (New): The fluoride as claimed in claim 60, wherein M is a mixture of at least two ions chosen from Mg^{2+}, Zn^{2+} and Co^{2+}.

Claim 68 (New): The fluoride as claimed in claim 60, wherein said fluoride is present in the form of a cube or a parallelepiped shape.

Claim 69 (New): The fluoride as claimed in claim 60, wherein the volume of said fluoride ranges from 2.5×10^{-3} cm to 30 cm^3.

Claim 70 (New): The fluoride as claimed in claim 69, wherein the volume ranges from 0.01 to 20 cm^3.

Claim 71 (New): The fluoride as claimed in claim 60, wherein said fluoride has a cleaved surface.

Claim 72 (New): The fluoride as claimed in claim 60, wherein said fluoride has a surface that is ground and then treated in an acid medium or polished,

Claim 73 (New): A method for preparing a monochromator, comprising utilizing the fluoride of claim 60.